

SEQUENCE LISTING

<110> Raghuram Kalluri

<120> ANTI-ANGIOGENIC PROTEINS AND FRAGMENTS
AND METHODS OF USE THEREOF

<130> 1440.1027-016

<150> PCT/US01/00565

<151> 2001-01-08

<150> US 09/543,371

<151> 2000-04-04

<150> US 09/335,224

<151> 1999-06-17

<150> US 60/126,175

<151> 1999-03-25

<150> US 60/089,689

<151> 1998-06-17

<150> US 09/479,118

<151> 2000-01-07

<150> US 09/625,191

<151> 2000-07-21

<160> 58

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 690

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)...(687)

<400> 1

| | |
|---|----|
| tct gtt gat cac ggc ttc ctt gtg acc agg cat agt caa aca ata gat | 48 |
| Ser Val Asp His Gly Phe Leu Val Thr Arg His Ser Gln Thr Ile Asp | |
| 1 5 10 15 | |

| | |
|---|----|
| gac cca cag tgt cct tct ggg acc aaa att ctt tac cac ggg tac tct | 96 |
| Asp Pro Gln Cys Pro Ser Gly Thr Lys Ile Leu Tyr His Gly Tyr Ser | |
| 20 25 30 | |

| | |
|---|-----|
| ttg ctc tac gtg caa ggc aat gaa cgg gcc cat gga cag gac ttg ggc | 144 |
| Leu Leu Tyr Val Gln Gly Asn Glu Arg Ala His Gly Gln Asp Leu Gly | |
| 35 40 45 | |

tgc aat att aac aac gtg tgc aac ttt gca tca cga aat gac tac tcg 240
Cys Asn Ile Asn Asn Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser
65 70 75 80

acg ggg gaa aac ata aga cca ttt att agt agg tgt gct gtg tgt gag 336
Thr Gly Glu Asn Ile Arg Pro Phe Ile Ser Arg Cys Ala Val Cys Glu
100 105 110

ccg tgc ccc agc ggg tgg tcc tcg ctg tgg atc ggc tac tct ttt gtg 432
 Pro Cys Pro Ser Gly Trp Ser Ser Leu Trp Ile Gly Tyr Ser Phe Val
 130 135 140

atg cac acc agc gct ggt gca gaa ggc tct ggc caa gcc ctg gcg tcc 480
Met His Thr Ser Ala Gly Ala Glu Gly Ser Gly Gln Ala Leu Ala Ser
145 150 155 160

ccc ggc tcc tgc ctg gag gag ttt aga agt gcg cca ttc atc gag tgt 528
Pro Gly Ser Cys Leu Glu Glu Phe Arg Ser Ala Pro Phe Ile Glu Cys
165 170 175

cac ggc cgt ggg acc tgc aat tac tac gca aac gct tac agc ttt tgg 576
 His Gly Arg Gly Thr Cys Asn Tyr Tyr Ala Asn Ala Tyr Ser Phe Trp
 180 185 190

ctc gcc acc ata gag agg agc gag atg ttc aag aag cct acg cgg tcc 624
Leu Ala Thr Ile Glu Arg Ser Glu Met Phe Lys Lys Pro Thr Pro Ser
195 200 205

acc ttg aag gca ggg gag ctg cgc acg cac gtc agc cgc tgc caa gtc 672
Thr Leu Lys Ala Gly Glu Leu Arg Thr His Val Ser Arg Cys Gln Val
210 215 220

tgt atg aga aga aca taa
Cys Met Arg Arg Thr
225

<211> 229

<212> PRT

<213> Homo sapiens

<400> 2

Ser Val Asp His Gly Phe Leu Val Thr Arg His Ser Gln Thr Ile Asp
1 5 10 15
Asp Pro Gln Cys Pro Ser Gly Thr Lys Ile Leu Tyr His Gly Tyr Ser
20 25 30

<222> (1) ... (681)

aag aac ctg tga
Lys Asn Leu

684

225

<210> 6
 <211> 227
 <212> PRT
 <213> Homo sapiens

<400> 6
 Val Ser Ile Gly Tyr Leu Leu Val Lys His Ser Gln Thr Asp Gln Glu
 1 5 10 15
 Pro Met Cys Pro Val Gly Met Asn Lys Leu Trp Ser Gly Tyr Ser Leu
 20 25 30
 Leu Tyr Phe Glu Gly Gln Glu Lys Ala His Asn Gln Asp Leu Gly Leu
 35 40 45
 Ala Gly Ser Cys Leu Ala Arg Phe Ser Thr Met Pro Phe Leu Tyr Cys
 50 55 60
 Asn Pro Gly Asp Val Cys Tyr Tyr Ala Ser Arg Asn Asp Lys Ser Tyr
 65 70 75 80
 Trp Leu Ser Thr Thr Ala Pro Leu Pro Met Met Pro Val Ala Glu Asp
 85 90 95
 Glu Ile Lys Pro Tyr Ile Ser Arg Cys Ser Val Cys Glu Ala Pro Ala
 100 105 110
 Ile Ala Ile Ala Val His Ser Gln Asp Val Ser Ile Pro His Cys Pro
 115 120 125
 Ala Gly Trp Arg Ser Leu Trp Ile Gly Tyr Ser Phe Leu Met His Thr
 130 135 140
 Ala Ala Gly Asp Glu Gly Gly Gln Ser Leu Val Ser Pro Gly Ser
 145 150 155 160
 Cys Leu Glu Asp Phe Arg Ala Thr Pro Phe Ile Glu Cys Asn Gly Gly
 165 170 175
 Arg Gly Thr Cys His Tyr Tyr Ala Asn Lys Tyr Ser Phe Trp Leu Thr
 180 185 190
 Thr Ile Pro Glu Gln Ser Phe Gln Gly Ser Pro Ser Ala Asp Thr Leu
 195 200 205
 Lys Ala Gly Leu Ile Arg Thr His Ile Ser Arg Cys Gln Val Cys Met
 210 215 220
 Lys Asn Leu

225
 <210> 7
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> pET22b(+) forward oligonucleotide primer for
 Canstatin

<400> 7
 cgggatacctg tcagcatcgg ctacctc

27

<210> 8
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> pET22b(+) reverse oligonucleotide primer for
 Canstatin

cccaagcttc aggttcttca tgcacac

27

<211> 738

<212> DNA

<213> Homo sapiens

$\langle 220 \rangle$

<221> CDS

<222> (1) ... (735)

<400> 9

cca ggt ttg aaa gga aaa cgt gga gac agt gga tca cct gca acc tgg 48
Pro Gly Leu Lys Gly Lys Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp
1 5 10 15

aca acg aga ggc ttt gtc ttc acc cga cac agt caa acc aca gca att 96
Thr Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile
20 25 30

cct tca tgt cca gag ggg aca gtg cca ctc tac agt ggg ttt tct ttt 144
Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe
35 40 45

ctt ttt gta caa gga aat caa cga gcc cac gga caa gac ctt gga act 192
Leu Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr
50 55 60

ctt ggc agc tgc ctg cag cga ttt acc aca atg cca ttc tta ttc tgc 240
Leu Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys
65 70 75 80

aat gtc aat gat gta tgt aat ttt gca tct cga aat gat tat tca tac 288
Asn Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr
85 90 95

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tgg | ctg | tca | aca | cca | gct | ctg | atg | cca | atg | aac | atg | gct | ccc | att | act | 336 |
| Trp | Leu | Ser | Thr | Pro | Ala | Leu | Met | Pro | Met | Asn | Met | Ala | Pro | Ile | Thr | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |

ggc aga gcc ctt gag cct tat ata agc aga tgc act gtt tgt gaa ggt 384
Gly Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly
115 120 125

cct gcg atc gcc ata gcc gtt cac agc caa acc act gac att cct cca 432
Pro Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro
130 135 140

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tgt | cct | cac | ggc | tgg | att | tct | ctc | tgg | aaa | gga | ttt | tca | ttc | atc | atg | 480 |
| Cys | Pro | His | Gly | Trp | Ile | Ser | Leu | Trp | Lys | Gly | Phe | Ser | Phe | Ile | Met | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |

ttc aca agt gca ggt tct gag ggc acc ggg caa gca ctg gcc tcc cct 528
Phe Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro
165 170 175

ggc tcc tgc ctg gaa gaa ttc cga gcc agc cca ttt cta gaa tgt cat 576
Gly Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His

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<210> 10
<211> 245
<212> PRT
<213> Homo sapiens

<400> 10
Pro Gly Leu Lys Gly Lys Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp
 1      5      10      15
Thr Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile
 20      25      30
Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe
 35      40      45
Leu Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr
 50      55      60
Leu Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys
 65      70      75      80
Asn Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr
 85      90      95
Trp Leu Ser Thr Pro Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr
 100      105      110
Gly Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly
 115      120      125
Pro Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro
 130      135      140
Cys Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser Phe Ile Met
 145      150      155      160
Phe Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro
 165      170      175
Gly Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His
 180      185      190
Gly Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu
 195      200      205
Ala Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr
 210      215      220
Val Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys
 225      230      235      240
Met Lys Lys Arg His
 245

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27

27

28

<210> 16

<211> 35
 <212> DNA
 <213> Artificial Sequence

<220>

<223> pPICZaA reverse oligonucleotide primer for Arresten

<400> 16
 tgctctagag gtgttcttct catacagact tggca

35

<210> 17
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>

<223> pPICZaA forward oligonucleotide primer for Canstatin

<400> 17
 ttcggaattc gtcagcatcg gctacctcct g

31

<210> 18
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>

<223> pPICZaA reverse oligonucleotide primer for Canstatin

<400> 18
 ggggtacccc caggttcttc atgcacacct gg

32

<210> 19
 <211> 244
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Tumstatin (amino acids 1-244)

<400> 19
 Pro Gly Leu Lys Gly Lys Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp
 1 5 10 15
 Thr Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile
 20 25 30
 Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe
 35 40 45
 Leu Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr
 50 55 60
 Leu Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys
 65 70 75 80
 Asn Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr
 85 90 95
 Trp Leu Ser Thr Pro Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr
 100 105 110
 Gly Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly

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      115              120              125
Pro Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro
      130              135              140
Cys Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser Phe Ile Met
145      150              155              160
Phe Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro
      165              170              175
Gly Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His
      180              185              190
Gly Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu
      195              200              205
Ala Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr
      210              215              220
Val Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys
225      230              235              240
Met Lys Lys Arg

```

<210> 20
<211> 124
<212> PRT
<213> Artificial Sequence

<220>
<223> Tumstatin 333 (amino acids 2-125 of SEQ ID NO:10)

```

<400> 20
Gly Leu Lys Gly Lys Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp Thr
 1              5              10              15
Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro
      20              25              30
Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe Leu
      35              40              45
Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu
      50              55              60
Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn
65      70              75              80
Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp
      85              90              95
Leu Ser Thr Pro Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly
      100              105              110
Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val
      115              120

```

<210> 21
<211> 119
<212> PRT
<213> Artificial Sequence

<220>
<223> Tumstatin 334 (amino acids 126-244 of SEQ ID NO:10)

```

<400> 21
Cys Glu Gly Pro Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp
 1              5              10              15
Ile Pro Pro Cys Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser

```

11/21

```

      20      25      30
Phe Ile Met Phe Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu
      35      40      45
Ala Ser Pro Gly Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu
      50      55      60
Glu Cys His Gly Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser
      65      70      75      80
Phe Trp Leu Ala Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile
      85      90      95
Pro Ser Thr Val Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys
      100      105      110
Gln Val Cys Met Lys Lys Arg
      115
```

<210> 22

<211> 191

<212> PRT

<213> Artificial Sequence

<220>

<223> Tum-1 (Tumstatin N53) (amino acids 54-244 of SEQ
ID NO:10)

<400> 22

```

Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu Gly Ser Cys Leu
 1      5      10      15
Gln Arg Phe Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp Val
      20      25      30
Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu Ser Thr Pro
      35      40      45
Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly Arg Ala Leu Glu
      50      55      60
Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro Ala Ile Ala Ile
      65      70      75      80
Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys Pro His Gly Trp
      85      90      95
Ile Ser Leu Trp Lys Gly Phe Ser Phe Ile Met Phe Thr Ser Ala Gly
      100      105      110
Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly Ser Cys Leu Glu
      115      120      125
Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly Arg Gly Thr Cys
      130      135      140
Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asn Pro
      145      150      155      160
Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val Lys Ala Gly Glu
      165      170      175
Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met Lys Lys Arg
      180      185      190
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<210> 23

<211> 132

<212> PRT

<213> Artificial Sequence

<220>

<223> Tum-2 (amino acids 1-132 of SEQ ID NO:10)

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[illegible]

<211> 112

<213> Artificial Sequence

<223> Tum-3 (amino acids 133-244 of SEQ ID NO:10)

| | | | | | | | | | | | | | | | |
|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|------------|-----------|-----|
| Ile 1 | Ala | Val | His | Ser 5 | Gln | Thr | Thr | Asp | Ile 10 | Pro | Pro | Cys | Pro | His 15 | Gly |
| Trp | Ile | Ser | Leu 20 | Trp | Lys | Gly | Phe | Ser 25 | Phe | Ile | Met | Phe | Thr 30 | Ser | Ala |
| Gly | Ser | Glu 35 | Gly | Thr | Gly | Gln | Ala 40 | Leu | Ala | Ser | Pro | Gly 45 | Ser | Cys | Leu |
| Glu | Glu 50 | Phe | Arg | Ala | Ser | Pro 55 | Phe | Leu | Glu | Cys | His 60 | Gly | Arg | Gly | Thr |
| Cys 65 | Asn | Tyr | Tyr | Ser | Asn 70 | Ser | Tyr | Ser | Phe | Trp 75 | Leu | Ala | Ser | Leu 80 | Asn |
| Pro | Glu | Arg | Met | Phe 85 | Arg | Lys | Pro | Ile | Pro 90 | Ser | Thr | Val | Lys | Ala 95 | Gly |
| Glu | Leu | Glu | Lys 100 | Ile | Ile | Ser | Arg | Cys 105 | Gln | Val | Cys | Met | Lys 110 | Lys | Arg |

<211> 64

<213> Artificial Sequence

<223> Tum-4 (amino acids 181-244 of SEQ ID NO:10)

Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly Arg Gly Thr
1 5 10 15
Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asn
20 25 30

<212> PRT

<213> Artificial Sequence

<220>

<223> T3 (amino acids 69-88 of SEQ ID NO:10)

<400> 29

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Gln | Arg | Phe | Thr | Thr | Met | Pro | Phe | Leu | Phe | Cys | Asn | Val | Asn | Asp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Cys | Asn | Phe | | | | | | | | | | | | |
| | | | | 20 | | | | | | | | | | | |

<210> 30

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> T4 (amino acids 84-103 of SEQ ID NO:10)

<400> 30

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Val | Cys | Asn | Phe | Ala | Ser | Arg | Asn | Asp | Tyr | Ser | Tyr | Trp | Leu | Ser |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Thr | Pro | Ala | Leu | | | | | | | | | | | | |
| | | | | 20 | | | | | | | | | | | |

<210> 31

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> T5 (amino acids 99-117 of SEQ ID NO:10)

<400> 31

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Thr | Pro | Ala | Leu | Met | Pro | Met | Asn | Met | Ala | Pro | Ile | Thr | Gly | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ala | Leu | Glu | | | | | | | | | | | | | |

<210> 32

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> T6 (amino acids 114-132 of SEQ ID NO:10)

<400> 32

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Ala | Leu | Glu | Pro | Tyr | Ile | Ser | Arg | Cys | Thr | Val | Cys | Glu | Gly | Pro |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ala | Ile | Ala | | | | | | | | | | | | | |

<210> 33

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<220>
<223> Tumstatin-45-132 (amino acids 45-132 of SEQ ID
NO:10)
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<210> 34
<211> 88
<212> PRT
<213> Artificial Sequence
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[illegible]

<220>
<223> synthetic blocking peptide

<400> 35
Cys Asp Cys Arg Gly Asp Cys Phe Cys

5

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic blocking peptide

<400> 36

Cys Asn Gly Arg Cys

1

5

<210> 37

<211> 25

<212> PRT

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> T7 (amino acids 74-98 of SEQ ID NO:10)

<400> 37

Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp Val Cys Asn Phe Ala

1

5

10

15

Ser Arg Asn Asp Tyr Ser Tyr Trp Leu

20

25

<210> 38

<211> 25

<212> PRT

<213> Artificial Sequence

$\langle 220 \rangle$

<223> T7-mutant (amino acids 74-98 of SEQ ID NO:10; methionine has been substituted for the leucine residue at position 78 of the full-length Tumstatin molecule, and isoleucine has been substituted for valine at position 82, and asparagine has been substituted for aspartic acid at position 84)

<400> 38

Thr Met Pro Phe Met Phe Cys Asn Ile Asn Asn Val Cys Asn Phe Ala

1

5

10

15

Ser Arg Asn Asp Tyr Ser Tyr Trp Leu

20

25

<210> 39

<211> 27

<212> PRT

<213> Artificial Sequence

$\langle 220 \rangle$

<223> T8 (amino acids 69-95 of SEQ ID NO:10; lysine has

<400> 39
Lys Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp
1 5 10 15
Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser
20 25

<220>
<223> T8-3 (amino acids 69-95 of SEQ ID NO:10; lysine has been substituted for the leucine residue at position 69 of the full-length Tumstatin molecule, and serine has been substituted for the cysteine residues at positions 80 and 86)

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<210> 41
<211> 19
<212> PRT
<213> Artificial Sequence
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<220>
<223> TP3 (amino acids 77-95 of SEQ ID NO:10; lysine has
been substituted for the phenylalanine residue at
position 77 of the full-length Tumstatin molecule,
and cysteine has been substituted for the aspartic
acid at position 84)
```

[illegible]

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<210> 42
<211> 27
<212> PRT
<213> Artificial Sequence
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<220>
<223> P2 (amino acids 69-95 of SEQ ID NO:10; lysine has
      been substituted for the leucine residue at
      position 69 of the full-length Tumstatin molecule,
      and aspartic acid has been substituted for the
      cysteine residues at positions 80 and 86)
```

<400> 42

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Gln | Arg | Phe | Thr | Thr | Met | Pro | Phe | Leu | Phe | Asp | Asn | Val | Asn | Asp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Asp | Asn | Phe | Ala | Ser | Arg | Asn | Asp | Tyr | Ser | | | | | |
| | | | 20 | | | | | 25 | | | | | | | |

<210> 43

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Scrambled peptide SP1

<400> 43

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Asn | Met | Ser | Arg | Asn | Val | Phe | Phe | Asp | Cys | Thr | Ser | Phe | Pro | Val |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Cys | Gln | Lys | Phe | Leu | Asn | Asp | Thr | Arg | Asn | Tyr | | | | | |
| | | | 20 | | | | | 25 | | | | | | | |

<210> 44

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Scrambled peptide SP2

<400> 44

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Phe | Asn | Cys | Val | Lys | Asn | Tyr | Gln | Arg | Leu | Asp | Phe | Thr | Ser | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Phe | Val | Met | Asp | Ser | Cys | Ala | Asn | Phe | Pro | Asn | | | | | |
| | | | 20 | | | | | 25 | | | | | | | |

<210> 45

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Generic peptide

<223> X at position 1 is a hydrogen or a peptidyl chain of 1 to 17 amino acids

<223> X at position 2 is F or K

<223> X at position 5 is C, S or D

<223> X at position 9 is D or C

<223> X at position 11 is C, S or D

<223> X at position 14 is a hydrogen or a peptidyl chain of 1 to 12 amino acids

Xaa Xaa Leu Phe Xaa Asn Val Asn Xaa Val Xaa Asn Phe Xaa
1 5 10

<211> 4

<213> Artificial Sequence

<223> Generic peptide

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Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu
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